

# Section 1.1

**Cell membrane:** separates the inside of the cell from the outside.

**Cytoplasm:** Is the Cytosol (the fluid) plus the organelles

**Mitochondria:** Where the energy of the cell comes from

**Ribosomes:** produce protein

**Endoplasmic reticulum:** Network that transports materials in the cell

**Vesicles:** Transport or store material

**Golgi body:** Sorts and packages proteins and molecules

**Nucleus:** Controls all cell activities

**Vacuoles:** Contain water and other materials and can store or transport small molecules

**Cytoskeleton:** The frame of the cell, helps maintain the shape

**Cell wall:** The tough rigid structure outside cell membrane (ONLY IN PLANT CELL)

**Chloroplasts:** Takes energy from the sun to make glucose, they make photosynthesis happen (ONLY IN PLANT CELL)

## The Cell Theory

1. All living organisms are made of one or more cells
2. The cell is basic organizational unit of life
3. All cells come from pre-existing cells

**Photosynthesis:** Light+Carbon Dioxide+Water→Glucose+Oxygen (How plants get energy)

**Respirations:** Glucose+Oxygen→ Carbon Dioxide+Energy (How animals get energy)

## Section 1.2

**DNA** (Deoxyribonucleic acid ) is material found in the cell nucleus that contains genetic information

**Gene** segment of DNA that controls protein production

**Chromosome** in a cell nucleus, a thread-like structure made mostly of DNA

**Base pair:** The rung of a DNA molecule, each base pair is made up of your building block molecules.

-Chromosomes made out of DNA

-DNA is made out of genes

-DNA screening is when we test people to see if they have certain genetic disorders.

-Ex. Testing for down syndrome in a pregnant woman.

-Ethical issues, some people may choose to abort the baby with the knowledge if it having a genetic disorder

-A genetically modified organism is an organism who's genes have been altered

**Mutation:** A change in the DNA of an organism

-The effects of a mutations is that It can change the type of protein that the gene produces

-Often mutations are caused by mutagens (Radiation, X-rays, chemicals etc...)

## Section 1.3

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**Mitosis:** The splitting of a cell's nucleus into two separate parts

**Prophase:** Chromatids condense and chromosomes become visible

**Metaphase:** Chromosomes align across the center of the cell

**Anaphase:** Centromere splits in half, and the chromatids are pulled to opposite ends of the cell.

**Telophase:** Two nuclei are formed

**Cell cycle checkpoints:** Point where the proteins determine if cell division should occur or not

-They are important because they won't let the cell cycle continue if it's not okay to. Ex. Not enough nutrients

**Tumour:** Abnormal clump or group of cells. Caused when the cell cycle checkpoints are ignored

**Cancer:** Abnormal cells that divide uncontrollably and spread.

**Mutagens:** are chemicals that alter the chemical structure of your DNA

-Carcinogens cause cancer

**Meristematic cells:** are specialized cell implants

- Constantly produce more cells
- Can perform specific tasks such as photosynthesis

**Leaves:** Provide a large surface area for photosynthesis to take place

**Stems:** Physical support, and transports water nutrients and sugar.

**Roots:** Anchor the plant in ground and allow the plant to take water and minerals from the soil

**Flower:** Reproductive organ

**Inside of a chloroplast:** Photosynthesis takes place

- Stacks of thylakoids called Grana
- A thylakoid contains chlorophyll that traps the sun's energy for photosynthesis

Xylem conducts water and phloem conducts sugar

**Root pressure:** Roots absorb minerals, water flows in to decrease the concentration of minerals creating pressure in the roots which pushes water up

**Transporational pull:** Water is sucked up through the stem to replace water that's been evaporated through the leaves

-Respiratory system in humans = leaves in plants

-Circulatory system in humans = xylem and phloem

-Reproductive system in humans = flowers

**Epithelial** –Provides coatings for things inside outside of body

Examples: Skin, coating of intestines (cilia). Stomach.

**Muscle** – Helps body movement

Example: Muscles, heart, stomach

**Nervous:** Coordinates body actions, links to brain, senses

Example: Nerves, brain spinal cord

**Connective:** Strengthens, supports and connects cells

Example: Bone, fat blood

### **Stem Cells:**

#### **Embryonic**

-most versatile

-Can become any kind of cell/tissue

-Also called totipotent

#### **Pluripotent**

-Can become many (but not all) types of cells

#### **Adult**

-least versatile

-Can only become specific types of cells

Cells > tissues>organ systems > body.

Cells>Heart Tissue>muscle cell    Heart>organ>circulatory system>body

Imaging Technique	Used For	How it works
X-Ray	Examining bones	X rays pass through soft tissue
CT Scan	Examining Organs without	X rays of thin slices are used to

	cutting people open	create a 3D image of a body part
Ultrasound	Observing babies in uterus also useful for measuring blood flow	High frequency sound waves are sent into you we measure how they bounce back to see the shape of stuff inside you.
MRI	Brain scans joints	Use radio waves in a magnetic field to create images of body parts

Circulatory system: transports blood, nutrients, gas and waste

Digestive system: Takes in food and breaks it down, absorbs nutrients and removes solid waste

Respiratory system: controls breathing

Excretory: removes liquid waste

Immune: defends body against infection

Muscular: works with bones to move your body

Endocrine: manufactures and releases hormones to keep body in balance

Reproductive system: organs to produce offspring

Integumentary: skin hair and nails and acts as your waterproof barrier around body

Nervous: Detects changes in the environments and signals body to respond

Skeletal: supports and works with muscles to move body